Access DB# 106111

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Jonathan Crepeau Examiner #: 75637 Date: 11-1-04
Art Unit: 1746 Phone Number 30 272-1299 Serial Number: 10/050,926
Mail Box and Bldg/Room Location: 6C11 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

_____

Earliest Priority Filing Date: _____

***For Sequence Searches Only** Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please see attached.

(NOT MUCH OUT THERE CLOSE)

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STAFF USE ONLY	Type of Search	Vendors and cost where applicable
Searcher: EA	NA Sequence (#)_____	STN _____
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Date Completed: 11-3-04	Litigation _____	Lexis/Nexis _____
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the appropriate serial number.
- *For Foreign Patent Family Searches Only*
  Include the country name and patent number.
- Provide examples or give us relevant citations, authors, etc., if known.
- FAX or send the **abstract, pertinent claims** (not all of the claims), **drawings, or chemical structures** to your EIC or branch library.

Enter your Search Topic Information below:

A battery electrode having any of the compositions defined in attached claims 1, 14, or 21.

Even though elements A and B are written in the formulas as "+A +bB," these are the critical parts of the formulas and should be searched as being an integral element in the compounds.
(Authors' citation not actually indexed this way, so had to search it both ways to be safe.)

Special Instructions and Other Comments:
(For fastest service, let us know the best times to contact you, in case the searcher needs further clarification on your search.)

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Enter your Contact Information below:

Name: Jonathan Crepeau
Employee Number: 75637 Phone: 272-1299
Art Unit or Office: 1746 Building & Room Number: REM 6C11

Enter the case serial number (Required): 10/050926
If not related to a patent application, please enter NA here.

Class / Subclass(es) 429/231

Earliest Priority Filing Date: 1/23/01

Format preferred for results:
☑ *Paper* ☐ *Diskette* ☐ *E-mail*

Provide detailed information on your search topic:

- In your own words, describe in detail the concepts or subjects you want us to search.
- Include synonyms, keywords, and acronyms. Define terms that have special meanings.
- *For Chemical Structure Searches Only*
  Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers
- *For Sequence Searches Only*
  Include all pertinent information (parent, child, divisional, or issued patent numbers) along with

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IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A lithium ion secondary battery, comprising:

a positive electrode comprising an active material containing a composite oxide;

a negative electrode; and a nonaqueous electrolyte;

the composite oxide having a composition represented by a structural formula (1) given below:

$$Li_x (Ni_{1-y}Me1_y) (O_{2-z}X_z) + A \quad \ldots (1)$$

where Me1 is at least one kind of an element selected from the group consisting of B, Mg, Al, Sc, Ti, V, Cr, Mn, Co, Cu, Zn, Ga, Y, Zr, Nb, Mo, Tc, Ru, Sn, La, Hf, Ta, W, Re, Pb and Bi, X is at least one kind of a halogen element selected from the group consisting of F, Cl, Br and I, the molar ratios x, y, z are $0.02 \leqq x \leqq 1.3$, $0.005 \leqq y \leqq 0.5$, and $0.01 \leqq z \leqq 0.5$, A contains Ca and at least one element selected from the group consisting of Na, K and S, and each of the Na content, the K content and the S content of the composite oxide falls within a range of ~~between~~ from 600 ppm ~~and~~ to 3,000 ppm, and the Ca content in said composite oxide is not higher than 500 ppm.

Claim 2 (Cancelled)

Claim 3 (Currently Amended): A lithium ion secondary battery according to claim ~~2~~ 1, wherein said element A includes a combination of Ca, Na and S, a combination of Na and Ca or a combination of S and Ca.

$0.01 \leqq z \leqq 0.5$, A contains Ca and at least one element selected from the group consisting of Na, K and S, and each of the Na content, the K content and the S content of the composite oxide falls within a range of ~~between~~ from 600 ppm ~~and~~ to 3,000 ppm and the Ca content in said composite oxide falls within a range of from 20 ppm to 500 ppm.

Claim 12 (Cancelled).

Claim 13 (Original): A lithium ion secondary battery according to claim 11, wherein said element Me2 is at least one kind of an element selected from the group consisting of Ti, V, Cr, Zr, Nb, Mo, Hf, Ta and W.

Claim 14 (Currently Amended): A lithium ion secondary battery, comprising:

a positive electrode comprising an active material containing a composite oxide;

a negative electrode; and

a nonaqueous electrolyte;

the composite oxide having a composition represented by a structural formula (4) given below:

$$Li_x(Ni_{1-v-s}Co_vMe2_s)(O_{2-z}X_z) + A + bB \quad \text{... (4)}$$

Me2 + A + B

where Me2 is at least one kind of an element selected from the group consisting of B, Mg, Al, Sc, Ti, V, Cr, Mn, Cu, Zn, Ga, Y, Zr, Nb, Mo, Tc, Ru, Sn, La, Hf, Ta, W, Re, Pb and Bi, X is at least one kind of a halogen element selected from the group consisting of F, Cl, Br and I, the molar ratios x, v, s and z are $0.02 \leq x \leq 1.3$, $0.005 \leq v \leq 0.5$, $0.005 \leq s \leq 0.5$ and $0.01 \leq z \leq 0.5$, A contains Ca and at least one element selected from the group consisting of Na, K and S, each of the Na content, the K content and the S content of the composite oxide falls within a range of ~~between~~ from 600 ppm ~~and~~ to 3,000 ppm, the Ca content in said composite oxide is not higher than 500 ppm, B contains at least one element selected from the group consisting of Si and Fe, and the content b of said element B in said composite oxide falls within a range of ~~between~~ from 20 ppm ~~and~~ to 500 ppm.

Claim 15 (Cancelled).

Claim 16 (Original): A lithium ion secondary battery according to claim 14, wherein said element Me2 is at least one kind of an element selected from the group consisting of Ti, V, Cr, Zr, Nb, Mo, Hf, Ta and W.

Claim 17 (Cancelled).

Claim 18 (Cancelled).

Claim 19 (Cancelled).

Claim 20 (Cancelled).

Claim 21. (New) A lithium ion secondary battery, comprising:

a positive electrode comprising an active material containing a composite oxide;

a negative electrode; and a nonaqueous electrolyte;

the composite oxide having a composition represented by a structural formula (1) given below:

$$Li_x (Ni_{1-y}Me1_y) (O_{2-z}X_z) + A \quad \ldots (1)$$

where Me1 is at least one kind of an element selected from the group consisting of B, Mg, Al, Sc, Ti, V, Cr, Mn, Co, Cu, Zn, Ga, Y, Zr, Nb, Mo, Tc, Ru, Sn, La, Hf, Ta, W, Re, Pb and Bi, X is at least one kind of a halogen element selected from the group consisting of F, Cl, Br and I, the molar ratios x, y, z are $0.02 \leqq x \leqq 1.3$, $0.005 \leqq y \leqq 0.5$, and $0.01 \leqq z \leqq 0.5$, A contains Na and S, and each of the Na content and the S content of the composite oxide falls within a range of from 600 ppm to 3,000 ppm.

was cancelled

22. (New) A lithium ion secondary battery according to claim 2, wherein said composite oxide further includes an element B containing at least one element selected from the group consisting of Se and Fe.

23. (New) A lithium ion secondary battery according to claim 22, wherein the content of said element B in said composite oxide falls within a range of from 20 ppm to 500 ppm.

24. (New) A lithium ion secondary battery according to claim 22, wherein the content of said element B in said composite oxide falls within a range of from 20 ppm to 250 ppm.

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L1           339 S LI/ELS (L) NI/ELS (L) (B OR MG OR AL OR SC OR TI OR V O
L2             3 S L1 (L) CA/ELS (L) (NA OR K OR S)/ELS
L3             2 S L2 (L) CO/ELS (L) (SI OR FE)/ELS
L4             2 S L1 (L) NA/ELS (L) S/ELS
L5             1 S L4 NOT CA/ELS

     FILE 'CAOLD' ENTERED AT 18:15:51 ON 03 NOV 2004
L6             0 S L2
L7             0 S L3
L8             0 S L4
L9             0 S L5

     FILE 'ZCAPLUS' ENTERED AT 18:16:05 ON 03 NOV 2004
L10            2 S L2
L11            2 S L3
L12            1 S L4
L13            1 S L5


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One invention same

claim 1

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=> d l10 1-2 ibib abs hitstr hitrn

L10  ANSWER 1 OF 2  ZCAPLUS  COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:         2002:573503  ZCAPLUS
DOCUMENT NUMBER:          137:143014
TITLE:                    Secondary lithium ion battery, cathode active
                          mass, and magnesia-based sagger for firing
                          lithium mixed oxide
INVENTOR(S):              Kanai, Hideyuki
```

PATENT ASSIGNEE(S): Toshiba Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002216758	A2	20020802	JP 2001-14890	200101 23
JP 3552210	B2	20040811		

PRIORITY APPLN. INFO.: JP 2001-14890 200101 23

AB The title battery is equipped with a cathode contg. a Li-contg. mixed oxide as cathode active mass, which is obtained by firing raw material powder in a sagger contg. MgO and/or MgAl2O4 spinel. The cathode active mass is also claimed. The sagger is also claimed. The cathode active mass has desired grain size distribution and the battery provides high safety by preventing ignition and long cycle life.

IT **444728-06-7P 444728-10-3P**
(lithium mixed oxide fired in sagger contg. MgO or MgAl2O4 for cathode in lithium battery)

RN 444728-06-7 ZCAPLUS
CN Calcium cobalt lithium nickel sodium sulfur fluoride oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
F	x	14762-94-8
S	x	7704-34-9
Ca	x	7440-70-2
Co	x	7440-48-4
Na	x	7440-23-5
Ni	x	7440-02-0
Li	x	7439-93-2

RN 444728-10-3 ZCAPLUS
CN Calcium cobalt iron lithium nickel sodium fluoride oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
F	x	14762-94-8
Ca	x	7440-70-2
Co	x	7440-48-4
Na	x	7440-23-5
Ni	x	7440-02-0
Li	x	7439-93-2
Fe	x	7439-89-6

IT **444728-06-7P 444728-10-3P**
(lithium mixed oxide fired in sagger contg. MgO or MgAl2O4 for cathode in lithium battery)

L10 ANSWER 2 OF 2 ZCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:260192 ZCAPLUS
DOCUMENT NUMBER: 132:296710
TITLE: Manufacture of enameled steel sheets using a composition enabling to avoid fish-scale
INVENTOR(S): Hemmen, Pascale; Cholet, Vincent; Vitter, Gerard
PATENT ASSIGNEE(S): Sollac, Fr.
SOURCE: PCT Int. Appl., 25 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000021896	A1	20000420	WO 1999-FR2383	19991006
W: BR, CA, JP, KR, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
FR 2784696	A1	20000421	FR 1998-12912	19981014
FR 2784696	B1	20001110		
CA 2347142	AA	20000420	CA 1999-2347142	19991006
BR 9914517	A	20010626	BR 1999-14517	

EP 1140719	A1	20011010	EP 1999-970375	19991006
EP 1140719	B1	20020904		19991006
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2002527614	T2	20020827	JP 2000-575807	
AT 223357	E	20020915	AT 1999-970375	19991006
PT 1140719	T	20021231	PT 1999-970375	19991006
ES 2181503	T3	20030216	ES 1999-970375	19991006
PRIORITY APPLN. INFO.:			FR 1998-12912 A	19981014
			WO 1999-FR2383 W	19991006

AB The two-layer enamel for the manuf. of both sides enameled-resistant steel sheets comprises a vitreous phase contg. .gtoreq.1 dispersed crystal mineral 2-25 wt.% (e.g.,15 or 25% of .beta.-Ga2O3) having a protonic cond. >10-6 S.cntdot.cm-1 at 3000. The mineral is dispersed in a proportion sufficient for providing the enamel with impermeability to hydrogen >10-11 g.cntdot.cm-2s-1 in the range of temps. between 3000 and the enamel glass transition temp. The dew point of the firing atm. is >50. The firing temp. is less than a low temp. limit of .alpha.-.gamma. transformation of the steel. The cooling rate of enameled steel sheets is >100/min between Ac3 and the enamel glass transition temp. (Ac3 is a top temp. limit of .alpha.-.gamma. transformation of the steel).

IT **264626-01-9**
(enameling with; manuf. of enameled steel sheets using a compn. enabling to avoid fish-scale)

RN 264626-01-9 ZCAPLUS

CN Aluminum barium boron calcium cobalt lithium nickel phosphorus potassium silicon sodium zirconium fluoride oxide (Al0.08Ba0.01B0.28Ca0.08Co0.01Li0.04Ni0.01P0.01K0.03Si0.5Na0.27Zr0.01F0.03O1.84) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.84	17778-80-2
F	0.03	14762-94-8
P	0.01	7723-14-0
Ca	0.08	7440-70-2
Zr	0.01	7440-67-7
Co	0.01	7440-48-4
B	0.28	7440-42-8
Ba	0.01	7440-39-3
Na	0.27	7440-23-5
Si	0.5	7440-21-3
K	0.03	7440-09-7
Ni	0.01	7440-02-0
Li	0.04	7439-93-2
Al	0.08	7429-90-5

IT **264626-01-9**
(enameling with; manuf. of enameled steel sheets using a compn. enabling to avoid fish-scale)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d l11 1-2 ibib abs hitstr hitrn

same as before

WW claim 14

L11 ANSWER 1 OF 2 ZCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:573503 ZCAPLUS
DOCUMENT NUMBER: 137:143014
TITLE: Secondary lithium ion battery, cathode active mass, and magnesia-based sagger for firing lithium mixed oxide
INVENTOR(S): Kanai, Hideyuki
PATENT ASSIGNEE(S): Toshiba Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

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JP 2002216758	A2	20020802	JP 2001-14890	

JP 3552210 B2 20040811 200101 23
PRIORITY APPLN. INFO.: JP 2001-14890 200101 23

AB The title battery is equipped with a cathode contg. a Li-contg. mixed oxide as cathode active mass, which is obtained by firing raw material powder in a sagger contg. MgO and/or $MgAl_2O_4$ spinel. The cathode active mass is also claimed. The sagger is also claimed. The cathode active mass has desired grain size distribution and the battery provides high safety by preventing ignition and long cycle life.

IT **444728-10-3P**
(lithium mixed oxide fired in sagger contg. MgO or $MgAl_2O_4$ for cathode in lithium battery)

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Ni	x	7440-02-0
Li	x	7439-93-2
Fe	x	7439-89-6

IT **444728-10-3P**
(lithium mixed oxide fired in sagger contg. MgO or $MgAl_2O_4$ for cathode in lithium battery)

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EP 1140719	B1	20020904		19991006
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2002527614	T2	20020827	JP 2000-575807	19991006
AT 223357	E	20020915	AT 1999-970375	19991006
PT 1140719	T	20021231	PT 1999-970375	19991006
ES 2181503	T3	20030216	ES 1999-970375	19991006

PRIORITY APPLN. INFO.:			
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	WO 1999-FR2383	W	19991006

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Zr	0.01	7440-67-7
Co	0.01	7440-48-4
B	0.28	7440-42-8
Ba	0.01	7440-39-3
Na	0.27	7440-23-5
Si	0.5	7440-21-3
K	0.03	7440-09-7
Ni	0.01	7440-02-0
Li	0.04	7439-93-2
Al	0.08	7429-90-5

IT **264626-01-9**
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=> d l12 1 ibib abs hitstr hitrn

↓↓↓ claim 21

Same as before

L12 ANSWER 1 OF 1 ZCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:573503 ZCAPLUS
DOCUMENT NUMBER: 137:143014
TITLE: Secondary lithium ion battery, cathode active mass, and magnesia-based sagger for firing lithium mixed oxide
INVENTOR(S): Kanai, Hideyuki
PATENT ASSIGNEE(S): Toshiba Corp., Japan
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DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
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JP 3552210	B2	20040811		
PRIORITY APPLN. INFO.:			JP 2001-14890	200101 23

AB The title battery is equipped with a cathode contg. a Li-contg. mixed oxide as cathode active mass, which is obtained by firing raw material powder in a sagger contg. MgO and/or $MgAl_2O_4$ spinel. The cathode active mass is also claimed. The sagger is also claimed. The cathode active mass has desired grain size distribution and the battery provides high safety by preventing ignition and long cycle life.

IT **444728-06-7P 444728-09-0P**
(lithium mixed oxide fired in sagger contg. MgO or $MgAl_2O_4$ for cathode in lithium battery)

RN 444728-06-7 ZCAPLUS

CN Calcium cobalt lithium nickel sodium sulfur fluoride oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
F	x	14762-94-8
S	x	7704-34-9
Ca	x	7440-70-2

Co	x	7440-48-4
Na	x	7440-23-5
Ni	x	7440-02-0
Li	x	7439-93-2

RN 444728-09-0 ZCAPLUS
CN Cobalt lithium nickel sodium sulfur fluoride oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
F	x	14762-94-8
S	x	7704-34-9
Co	x	7440-48-4
Na	x	7440-23-5
Ni	x	7440-02-0
Li	x	7439-93-2

IT **444728-06-7P 444728-09-0P**
(lithium mixed oxide fired in sagger contg. MgO or MgAl2O4 for cathode in lithium battery)

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(dup)

L13 ANSWER 1 OF 1 ZCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:573503 ZCAPLUS
DOCUMENT NUMBER: 137:143014
TITLE: Secondary lithium ion battery, cathode active mass, and magnesia-based sagger for firing lithium mixed oxide
INVENTOR(S): Kanai, Hideyuki
PATENT ASSIGNEE(S): Toshiba Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

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JP 2002216758	A2	20020802	JP 2001-14890	200101 23

JP 3552210 B2 20040811
PRIORITY APPLN. INFO.: JP 2001-14890
200101
23

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IT **444728-09-0P**
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RN 444728-09-0 ZCAPLUS

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Ni	x	7440-02-0
Li	x	7439-93-2

IT **444728-09-0P**
(lithium mixed oxide fired in sagger contg. MgO or $MgAl_2O_4$ for cathode in lithium battery)

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=> d his l14-

     FILE 'HCAPLUS' ENTERED AT 18:23:37 ON 03 NOV 2004
L14          6764 S KANAI ?/AU
L15          6800 S KANDA ?/AU
L16         17907 S KUBO ?/AU
L17             6 S L14 AND L15 AND L16
                  SEL L17 1-4 RN

     FILE 'REGISTRY' ENTERED AT 18:31:14 ON 03 NOV 2004
L18           163 S E1-E163
L19           134 S L1 AND L18
                  E CALCIUM/CN
L20             1 S E3
                  E SODIUM/CN
L21             1 S E3
                  E POTASSIUM/CN
L22             1 S E3
                  E SULFUR/CN
L23             1 S E3

     FILE 'ZCAPLUS' ENTERED AT 18:39:02 ON 03 NOV 2004
L24            69 S L1
L25        347462 S L20
L26        208733 S L21
L27        203406 S L22
L28        129141 S L23
L29             1 S L24 AND L25
L30             1 S L29 AND (L26 OR L27 OR L28)

     FILE 'REGISTRY' ENTERED AT 18:40:50 ON 03 NOV 2004
L31           155 S L1 (L) CO/ELS

     FILE 'ZCAPLUS' ENTERED AT 18:41:11 ON 03 NOV 2004
L32            34 S L31
L33             1 S L32 AND L25
L34             1 S L33 AND (L26 OR L27 OR L28)

     FILE 'ZCAPLUS' ENTERED AT 18:43:21 ON 03 NOV 2004
L35             1 S L24 AND (L26 AND L28)
L36             1 S L30 OR L34 OR L35

=> d l36 1 ibib abs hitstr hitrn
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(ended up being inventors' own work)

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L36 ANSWER 1 OF 1  ZCAPLUS  COPYRIGHT 2004 ACS on STN
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ACCESSION NUMBER: 2002:552265 ZCAPLUS
DOCUMENT NUMBER: 137:127521
TITLE: Nickel-based and nickel-cobalt-based mixed oxide-halides as cathode-active materials for lithium-ion secondary batteries
INVENTOR(S): Hideyuki, Kanai; Kanda, Motoya; Kubo, Koichi
PATENT ASSIGNEE(S): Kabushiki Kaisha Toshiba, Japan
SOURCE: Eur. Pat. Appl., 60 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1225650	A2	20020724	EP 2002-250420	20020122
EP 1225650	A3	20030827		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2002304994	A2	20021018	JP 2002-12013	20020121
JP 3530174	B2	20040524		
US 2002150820	A1	20021017	US 2002-50926	20020122

PRIORITY APPLN. INFO.: JP 2001-14891 A 20010123

AB Cathode active material for lithium ion secondary batteries contain a composite oxide having a compn. of structural formula (1): Lix(Ni1-yMy)(O2-zXz) + A, in which M is at least one kind of an element selected from the group consisting of B, Mg, Al, Sc, Ti, V, Cr, Mn, Co, Cu, Zn, Ga, Y, Zr, Nb, Mo, Tc, Ru, Sn, La, Hf, Ta, W, Re, Pb and Bi; X is a halogen (F, Cl, Br and I); x = 0.02-1.3, 0.005 .ltoreq. y .ltoreq. 0.5, and z = 0.01-0.5; A contains at least one element selected from the group consisting of Na, K and S, and each of the Na, K, and S contents of the composite oxide is 600-3,000 ppm. A related compn. is Lix(Ni1-v-sCovM's)(O2-zXz) + A, in which M', A, and X are as defined above; x = 0.02-1.3, v = 0.005-0.05, s = 0.005-0.5, and z = 0.01-0.05.

IT **7440-09-7D**, Potassium, compds. **7440-23-5D**, Sodium, compds. **7440-70-2D**, Calcium, compds. **7704-34-9D**,

Sulfur, compds. **443892-75-9**, Lithium nickel borate fluoride oxide (Li1.1Ni0.88(BO3)0.02F0.1O1.84) **443892-76-0**, Lithium magnesium nickel fluoride oxide (Li1.1Mg0.02Ni0.88F0.1O1.9) **443892-77-1**, Aluminum lithium nickel fluoride oxide (Al0.02Li1.1Ni0.88F0.1O1.9) **443892-78-2**, Lithium nickel scandium fluoride oxide (Li1.1Ni0.88Sc0.02F0.1O1.9) **443892-79-3**, Lithium nickel vanadium fluoride oxide (Li1.1Ni0.88V0.02F0.1O1.9) **443892-80-6**, Chromium lithium nickel fluoride oxide (Cr0.02Li1.1Ni0.88F0.1O1.9) **443892-81-7**, Lithium manganese nickel fluoride oxide (Li1.1Mn0.02Ni0.88F0.1O1.9) **443892-82-8**, Lithium nickel zinc fluoride oxide (Li1.1Ni0.88Zn0.02F0.1O1.9) **443892-83-9**, Gallium lithium nickel chloride oxide (Ga0.02Li1.1Ni0.88Cl0.1O1.9) **443892-84-0**, Lithium nickel vanadium chloride oxide (Li1.1Ni0.88V0.02Cl0.1O1.9) **443892-85-1**, Lithium nickel zirconium chloride oxide (Li1.1Ni0.88Zr0.02Cl0.1O1.9) **443892-86-2**, Lithium molybdenum nickel bromide oxide (Li1.1Mo0.02Ni0.88Br0.1O1.9) **443892-87-3**, Lithium nickel technetium bromide oxide (Li1.1Ni0.8899Tc0.02Br0.1O1.9) **443892-88-4**, Lithium nickel ruthenium bromide oxide (Li1.1Ni0.88Ru0.02Br0.1O1.9) **443892-89-5**, Lithium nickel tin bromide oxide (Li1.1Ni0.88Sn0.02Br0.1O1.9) **443892-90-8**, Hafnium lithium nickel iodide oxide (Hf0.02Li1.1Ni0.88I0.1O1.9) **443892-91-9**, Lithium nickel tungsten iodide oxide (Li1.1Ni0.88W0.02I0.1O1.9) **443892-92-0**, Lithium nickel rhenium iodide oxide (Li1.1Ni0.88Re0.02I0.1O1.9) **443892-93-1**, Bismuth lithium nickel iodide oxide (Bi0.02Li1.1Ni0.88I0.1O1.9) **443892-94-2**, Lithium nickel titanium fluoride oxide (Li1.1Ni0.88Ti0.02F0.1O1.9) **443892-95-3**, Lithium nickel niobium chloride oxide (Li1.1Ni0.88Nb0.02Cl0.1O1.9) **443892-96-4**, Copper lithium nickel chloride oxide (Cu0.02Li1.1Ni0.88Cl0.1O1.9) **443892-97-5**, Lithium nickel tantalum iodide oxide (Li1.1Ni0.88Ta0.02I0.1O1.9) **443893-00-3**, Lanthanum lithium nickel fluoride oxide (La0.02Li1.1Ni0.88F0.1O1.9) **443893-01-4**, Cobalt lithium nickel fluoride oxide (Co0.02Li1.1Ni0.88F0.1O1.9) **443893-02-5** **443893-03-6** **443893-04-7** **443893-05-8** **443893-06-9** **443893-07-0** **443893-08-1** **443893-09-2** **443893-10-5** **443893-11-6** **443893-12-7** **443893-13-8**, Cobalt lithium nickel tin bromide oxide (Co0.18Li1.1Ni0.7Sn0.02Br0.1O1.9) **443893-14-9** **443893-15-0** **443893-16-1**, Cobalt lead lithium nickel iodide oxide (Co0.18Pb0.02Li1.1Ni0.7I0.1O1.9) **443893-17-2** **443893-18-3** **443893-19-4** **443893-20-7** **443893-21-8** **443893-22-9** **443893-23-0** **443893-24-1** **443893-25-2**

443893-26-3
(cathode material; nickel-based and nickel-cobalt-based mixed oxide-halides as cathode-active materials for lithium-ion secondary batteries)
RN 7440-09-7 ZCAPLUS
CN Potassium (8CI, 9CI) (CA INDEX NAME)

K

RN 7440-23-5 ZCAPLUS
CN Sodium (8CI, 9CI) (CA INDEX NAME)

Na

RN 7440-70-2 ZCAPLUS
CN Calcium (8CI, 9CI) (CA INDEX NAME)

Ca

RN 7704-34-9 ZCAPLUS
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 443892-75-9 ZCAPLUS
CN Lithium nickel borate fluoride oxide (Li1.1Ni0.88(BO3)0.02F0.1O1.84) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.84	17778-80-2
F	0.1	14762-94-8
BO3	0.02	14213-97-9
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-76-0 ZCAPLUS
CN Lithium magnesium nickel fluoride oxide (Li1.1Mg0.02Ni0.88F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Ni	0.88	7440-02-0
Mg	0.02	7439-95-4
Li	1.1	7439-93-2

RN 443892-77-1 ZCAPLUS
CN Aluminum lithium nickel fluoride oxide (Al0.02Li1.1Ni0.88F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Ni	0.88	7440-02-0
Li	1.1	7439-93-2
Al	0.02	7429-90-5

RN 443892-78-2 ZCAPLUS
CN Lithium nickel scandium fluoride oxide (Li1.1Ni0.88Sc0.02F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Sc	0.02	7440-20-2
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-79-3 ZCAPLUS
CN Lithium nickel vanadium fluoride oxide (Li1.1Ni0.88V0.02F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
V	0.02	7440-62-2
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-80-6 ZCAPLUS
CN Chromium lithium nickel fluoride oxide (Cr0.02Li1.1Ni0.88F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Cr	0.02	7440-47-3
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-81-7 ZCAPLUS
CN Lithium manganese nickel fluoride oxide (Li1.1Mn0.02Ni0.88F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Ni	0.88	7440-02-0
Mn	0.02	7439-96-5
Li	1.1	7439-93-2

RN 443892-82-8 ZCAPLUS
CN Lithium nickel zinc fluoride oxide (Li1.1Ni0.88Zn0.02F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Zn	0.02	7440-66-6
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-83-9 ZCAPLUS
CN Gallium lithium nickel chloride oxide (Ga0.02Li1.1Ni0.88Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1

O	1.9	17778-80-2
Ga	0.02	7440-55-3
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-84-0 ZCAPLUS
CN Lithium nickel vanadium chloride oxide (Li1.1Ni0.88V0.02Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
V	0.02	7440-62-2
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-85-1 ZCAPLUS
CN Lithium nickel zirconium chloride oxide (Li1.1Ni0.88Zr0.02Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
Zr	0.02	7440-67-7
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-86-2 ZCAPLUS
CN Lithium molybdenum nickel bromide oxide (Li1.1Mo0.02Ni0.88Br0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
Br	0.1	10097-32-2
Ni	0.88	7440-02-0
Mo	0.02	7439-98-7
Li	1.1	7439-93-2

RN 443892-87-3 ZCAPLUS
CN Lithium nickel technetium bromide oxide (Li1.1Ni0.8899Tc0.02Br0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
Tc	0.02	14133-76-7
Br	0.1	10097-32-2
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-88-4 ZCAPLUS
CN Lithium nickel ruthenium bromide oxide (Li1.1Ni0.88Ru0.02Br0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
Br	0.1	10097-32-2
Ru	0.02	7440-18-8
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-89-5 ZCAPLUS
CN Lithium nickel tin bromide oxide (Li1.1Ni0.88Sn0.02Br0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
Br	0.1	10097-32-2
Sn	0.02	7440-31-5
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-90-8 ZCAPLUS
CN Hafnium lithium nickel iodide oxide (Hf0.02Li1.1Ni0.88I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
Hf	0.02	7440-58-6
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-91-9 ZCAPLUS
CN Lithium nickel tungsten iodide oxide (Li1.1Ni0.88W0.02I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
W	0.02	7440-33-7
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-92-0 ZCAPLUS
CN Lithium nickel rhenium iodide oxide (Li1.1Ni0.88Re0.02I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
Re	0.02	7440-15-5
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-93-1 ZCAPLUS
CN Bismuth lithium nickel iodide oxide (Bi0.02Li1.1Ni0.88I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
Bi	0.02	7440-69-9
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-94-2 ZCAPLUS
CN Lithium nickel titanium fluoride oxide (Li1.1Ni0.88Ti0.02F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8

Ti	0.02	7440-32-6
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-95-3 ZCAPLUS
CN Lithium nickel niobium chloride oxide (Li1.1Ni0.88Nb0.02Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
Nb	0.02	7440-03-1
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-96-4 ZCAPLUS
CN Copper lithium nickel chloride oxide (Cu0.02Li1.1Ni0.88Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
Cu	0.02	7440-50-8
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443892-97-5 ZCAPLUS
CN Lithium nickel tantalum iodide oxide (Li1.1Ni0.88Ta0.02I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
Ta	0.02	7440-25-7
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443893-00-3 ZCAPLUS
CN Lanthanum lithium nickel fluoride oxide (La0.02Li1.1Ni0.88F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component

		Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Ni	0.88	7440-02-0
Li	1.1	7439-93-2
La	0.02	7439-91-0

RN 443893-01-4 ZCAPLUS
CN Cobalt lithium nickel fluoride oxide (Co0.02Li1.1Ni0.88F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Co	0.02	7440-48-4
Ni	0.88	7440-02-0
Li	1.1	7439-93-2

RN 443893-02-5 ZCAPLUS
CN Cobalt lithium nickel borate fluoride oxide (Co0.18Li1.1Ni0.7(BO3)0.02F0.1O1.84) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.84	17778-80-2
F	0.1	14762-94-8
BO3	0.02	14213-97-9
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-03-6 ZCAPLUS
CN Cobalt lithium magnesium nickel fluoride oxide (Co0.18Li1.1Mg0.02Ni0.7F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Mg	0.02	7439-95-4
Li	1.1	7439-93-2

RN 443893-04-7 ZCAPLUS
CN Aluminum cobalt lithium nickel fluoride oxide (Al0.02Co0.18Li1.1Ni0.7F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2
Al	0.02	7429-90-5

RN 443893-05-8 ZCAPLUS
CN Cobalt lithium nickel scandium fluoride oxide (Co0.18Li1.1Ni0.7Sc0.02F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Co	0.18	7440-48-4
Sc	0.02	7440-20-2
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-06-9 ZCAPLUS
CN Cobalt lithium manganese nickel fluoride oxide (Co0.18Li1.1Mn0.02Ni0.7F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Mn	0.02	7439-96-5
Li	1.1	7439-93-2

RN 443893-07-0 ZCAPLUS
CN Cobalt copper lithium nickel chloride oxide (Co0.18Cu0.02Li1.1Ni0.7Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component

		Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
Cu	0.02	7440-50-8
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-08-1 ZCAPLUS
CN Cobalt lithium nickel zinc chloride oxide (Co0.18Li1.1Ni0.7Zn0.02Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
Zn	0.02	7440-66-6
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-09-2 ZCAPLUS
CN Cobalt gallium lithium nickel chloride oxide (Co0.18Ga0.02Li1.1Ni0.7Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
Ga	0.02	7440-55-3
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-10-5 ZCAPLUS
CN Cobalt lithium nickel yttrium chloride oxide (Co0.18Li1.1Ni0.7Y0.02Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
Y	0.02	7440-65-5
Co	0.18	7440-48-4

Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-11-6 ZCAPLUS
CN Cobalt lithium nickel technetium bromide oxide (Co0.18Li1.1Ni0.799Tc0.02Br0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
Tc	0.02	14133-76-7
Br	0.1	10097-32-2
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-12-7 ZCAPLUS
CN Cobalt lithium nickel ruthenium bromide oxide (Co0.18Li1.1Ni0.7Ru0.02Br0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
Br	0.1	10097-32-2
Co	0.18	7440-48-4
Ru	0.02	7440-18-8
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-13-8 ZCAPLUS
CN Cobalt lithium nickel tin bromide oxide (Co0.18Li1.1Ni0.7Sn0.02Br0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
Br	0.1	10097-32-2
Co	0.18	7440-48-4
Sn	0.02	7440-31-5
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-14-9 ZCAPLUS
CN Cobalt lanthanum lithium nickel iodide oxide (Co0.18La0.02Li1.1Ni0.7I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2
La	0.02	7439-91-0

RN 443893-15-0 ZCAPLUS
CN Cobalt lithium nickel rhenium iodide oxide (Co0.18Li1.1Ni0.7Re0.02I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
Co	0.18	7440-48-4
Re	0.02	7440-15-5
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-16-1 ZCAPLUS
CN Cobalt lead lithium nickel iodide oxide (Co0.18Pb0.02Li1.1Ni0.7I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2
Pb	0.02	7439-92-1

RN 443893-17-2 ZCAPLUS
CN Bismuth cobalt lithium nickel iodide oxide (Bi0.02Co0.18Li1.1Ni0.7I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8

Bi	0.02	7440-69-9
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-18-3 ZCAPLUS
CN Cobalt lithium nickel titanium fluoride oxide (Co0.18Li1.1Ni0.7Ti0.02F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Co	0.18	7440-48-4
Ti	0.02	7440-32-6
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-19-4 ZCAPLUS
CN Cobalt lithium nickel vanadium fluoride oxide (Co0.18Li1.1Ni0.7V0.02F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
V	0.02	7440-62-2
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-20-7 ZCAPLUS
CN Chromium cobalt lithium nickel fluoride oxide (Cr0.02Co0.18Li1.1Ni0.7F0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
F	0.1	14762-94-8
Co	0.18	7440-48-4
Cr	0.02	7440-47-3
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-21-8 ZCAPLUS

CN Cobalt lithium nickel zirconium chloride oxide (Co0.18Li1.1Ni0.7Zr0.02Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
Zr	0.02	7440-67-7
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-22-9 ZCAPLUS
CN Cobalt lithium nickel niobium chloride oxide (Co0.18Li1.1Ni0.7Nb0.02Cl0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.1	22537-15-1
O	1.9	17778-80-2
Co	0.18	7440-48-4
Nb	0.02	7440-03-1
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-23-0 ZCAPLUS
CN Cobalt lithium molybdenum nickel bromide oxide (Co0.18Li1.1Mo0.02Ni0.7Br0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
Br	0.1	10097-32-2
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Mo	0.02	7439-98-7
Li	1.1	7439-93-2

RN 443893-24-1 ZCAPLUS
CN Cobalt hafnium lithium nickel bromide oxide (Co0.18Hf0.02Li1.1Ni0.7Br0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O	1.9	17778-80-2
Br	0.1	10097-32-2
Hf	0.02	7440-58-6
Co	0.18	7440-48-4
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-25-2 ZCAPLUS
CN Cobalt lithium nickel tantalum iodide oxide (Co0.18Li1.1Ni0.7Ta0.02I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
Co	0.18	7440-48-4
Ta	0.02	7440-25-7
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

RN 443893-26-3 ZCAPLUS
CN Cobalt lithium nickel tungsten iodide oxide (Co0.18Li1.1Ni0.7W0.02I0.1O1.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9	17778-80-2
I	0.1	14362-44-8
Co	0.18	7440-48-4
W	0.02	7440-33-7
Ni	0.7	7440-02-0
Li	1.1	7439-93-2

IT **7440-09-7D**, Potassium, compds. **7440-23-5D**, Sodium, compds. **7440-70-2D**, Calcium, compds. **7704-34-9D**, Sulfur, compds. **443892-75-9**, Lithium nickel borate fluoride oxide (Li1.1Ni0.88(BO3)0.02F0.1O1.84) **443892-76-0**, Lithium magnesium nickel fluoride oxide (Li1.1Mg0.02Ni0.88F0.1O1.9) **443892-77-1**, Aluminum lithium nickel fluoride oxide (Al0.02Li1.1Ni0.88F0.1O1.9) **443892-78-2**, Lithium nickel scandium fluoride oxide (Li1.1Ni0.88Sc0.02F0.1O1.9) **443892-79-3**, Lithium nickel vanadium fluoride oxide (Li1.1Ni0.88V0.02F0.1O1.9) **443892-80-6**, Chromium lithium nickel fluoride oxide (Cr0.02Li1.1Ni0.88F0.1O1.9) **443892-81-7**, Lithium manganese nickel fluoride oxide (Li1.1Mn0.02Ni0.88F0.1O1.9)

443892-82-8, Lithium nickel zinc fluoride oxide (Li1.1Ni0.88Zn0.02F0.1O1.9) **443892-83-9,** Gallium lithium nickel chloride oxide (Ga0.02Li1.1Ni0.88Cl0.1O1.9) **443892-84-0,** Lithium nickel vanadium chloride oxide (Li1.1Ni0.88V0.02Cl0.1O1.9) **443892-85-1,** Lithium nickel zirconium chloride oxide (Li1.1Ni0.88Zr0.02Cl0.1O1.9) **443892-86-2,** Lithium molybdenum nickel bromide oxide (Li1.1Mo0.02Ni0.88Br0.1O1.9) **443892-87-3,** Lithium nickel technetium bromide oxide (Li1.1Ni0.8899Tc0.02Br0.1O1.9) **443892-88-4,** Lithium nickel ruthenium bromide oxide (Li1.1Ni0.88Ru0.02Br0.1O1.9) **443892-89-5,** Lithium nickel tin bromide oxide (Li1.1Ni0.88Sn0.02Br0.1O1.9) **443892-90-8** , Hafnium lithium nickel iodide oxide (Hf0.02Li1.1Ni0.88I0.1O1.9) **443892-91-9,** Lithium nickel tungsten iodide oxide (Li1.1Ni0.88W0.02I0.1O1.9) **443892-92-0,** Lithium nickel rhenium iodide oxide (Li1.1Ni0.88Re0.02I0.1O1.9) **443892-93-1** , Bismuth lithium nickel iodide oxide (Bi0.02Li1.1Ni0.88I0.1O1.9) **443892-94-2,** Lithium nickel titanium fluoride oxide (Li1.1Ni0.88Ti0.02F0.1O1.9) **443892-95-3,** Lithium nickel niobium chloride oxide (Li1.1Ni0.88Nb0.02Cl0.1O1.9) **443892-96-4,** Copper lithium nickel chloride oxide (Cu0.02Li1.1Ni0.88Cl0.1O1.9) **443892-97-5,** Lithium nickel tantalum iodide oxide (Li1.1Ni0.88Ta0.02I0.1O1.9) **443893-00-3,** Lanthanum lithium nickel fluoride oxide (La0.02Li1.1Ni0.88F0.1O1.9) **443893-01-4,** Cobalt lithium nickel fluoride oxide (Co0.02Li1.1Ni0.88F0.1O1.9) **443893-02-5 443893-03-6 443893-04-7 443893-05-8 443893-06-9 443893-07-0 443893-08-1 443893-09-2 443893-10-5 443893-11-6 443893-12-7 443893-13-8,** Cobalt lithium nickel tin bromide oxide (Co0.18Li1.1Ni0.7Sn0.02Br0.1O1.9) **443893-14-9 443893-15-0 443893-16-1,** Cobalt lead lithium nickel iodide oxide (Co0.18Pb0.02Li1.1Ni0.7I0.1O1.9) **443893-17-2 443893-18-3 443893-19-4 443893-20-7 443893-21-8 443893-22-9 443893-23-0 443893-24-1 443893-25-2 443893-26-3**

(cathode material; nickel-based and nickel-cobalt-based mixed oxide-halides as cathode-active materials for lithium-ion secondary batteries)